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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,120	10/28/2003	Robert Hughes Jones	2137JB.45701	6096

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EXAMINER	
HUGHES, SCOTT A	

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/695,120	JONES ET AL.	
	Examiner	Art Unit	
	Scott A Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/28/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Deflandre.

With regard to claim 1, Deflandre discloses a method of monitoring microseismic events in a hydrocarbon production reservoir P providing with a well 1 (Fig. 1) comprising an inner production tubing 3 and an outer casing 2 (abstract; Column 5, Lines 25-54). Deflandre discloses providing two or more microseismic sensors R adjacent the outer casing (Figs. 1-4) (Column 5, Lines 40-47). Deflandre discloses processing an output of the microseismic sensors in order to provide the microseismic sensors with a directional response comprising a reduced sensitivity to noise coming from a direction of the inner production tubing, such that an ability of the microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced (Columns 3 and 4; Column 6, Lines 55-61). Deflandre discloses that the seismic receivers can be parameterized so that they record only significant signals containing information about the site. These signals that are processed with the directional response to have sensitivity to signals that are

significant are disclosed E type signals. Deflandre discloses that C type signals are signals from the production tubing.

With regard to claim 3, Deflandre discloses two or more second microseismic sensors 28, 29 that are provided between the inner production tubing and microseismic sensors located adjacent the outer casing (Fig. 5) (Column 3, Line 65 to Column 4, Line 51; Column 6, Lines 40-55). Deflandre discloses output of the second microseismic sensors nearer the production tubing being processed in conjunction with output of the microseismic sensors adjacent the outer casing in order to further enhance an ability of the sensors adjacent the outer casing to detect microseismic signals over a fluid flow noise (Column 6, Line 55 to Column 7, Line 65; Column 3, Line 65 to Column 4, Line 17).

With regard to claim 4, Deflandre discloses that an increased sound insulation is provided between the microseismic sensors located adjacent the outer casing and the inner production tubing in order to further enhance an ability of the microseismic sensors adjacent the outer casing to detect microseismic signals over a fluid flow noise (Figs, 2-4) (Column 5, Lines 42-47; Column 6, Lines 3-40). Deflandre discloses sound insulation provided between the sensors located adjacent the outer casing and the inner production tubing by acoustically decoupling the sensors from the production tubing 3 and clamping them to the casing.

With regard to claim 5, Deflandre discloses a method of monitoring microseismic events in a hydrocarbon production P (Fig. 1) reservoir provided with a well 1 comprising an inner production tubing 3 and an outer casing 2 (abstract, Column 5,

Lines 25-54). Deflandre discloses providing one or more first microseismic sensors R adjacent the outer casing of the well (Figs. 1-4) (Column 5, Lines 40-47). Deflandre discloses providing one or more second microseismic sensors 28,29 between the inner production tubing and the first microseismic sensors located adjacent the outer casing (Fig. 5) (Column 3, Line 65 to Column 4, Line 51; Column 6, Lines 40-55). Deflandre discloses processing the output of the second microseismic sensors nearer the inner production tubing in conjunction with output of the first microseismic sensors adjacent the outer casing such that the ability of the first microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced (Column 6, Line 55 to Column 7, Line 65; Column 3, Line 65 to Column 4, Line 17).

With regard to claim 6, Deflandre discloses that an increased sound insulation is provided between the casing sensors and the production tubing in order to further enhance the ability of the sensors adjacent the casing to detect microseismic signals over the fluid flow noise (Figs, 2-4) (Column 5, Lines 42-47; Column 6, Lines 3-40). Deflandre discloses sound insulation provided between the sensors located adjacent the outer casing and the inner production tubing by acoustically decoupling the sensors from the production tubing 3 and clamping them to the casing.

With regard to claim 7, Deflandre discloses a method of monitoring microseismic events in a hydrocarbon production reservoir P (Fig. 1) provided with a well 1 comprising an inner production tubing 3 and an outer casing 4 (abstract; Column 5, Lines 25-54). Deflandre discloses providing one or more microseismic sensors R

adjacent the outer casing (Figs. 1-4) (Column 5, Lines 40-47). Deflandre discloses providing increased sound insulation between the microseismic sensors and the inner production tubing such that an ability of the microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced (Figs, 2-4) (Column 5, Lines 42-47; Column 6, Lines 3-40). Deflandre discloses sound insulation provided between the sensors located adjacent the outer casing and the inner production tubing by acoustically decoupling the sensors from the production tubing 3 and clamping them to the casing.

With regard to claim 8, Deflandre discloses an installation for monitoring microseismic events in a hydrocarbon reservoir P (Fig. 1) provided with a well 1 comprising an inner production tubing 3 and an outer casing 2 (Column 5, Lines 25-54). Deflandre discloses that the installation comprises one ore more first microseismic sensors R adjacent the outer casing 2 (Figs. 1-4) (Column 5, Lines 40-47; Column 6) and means for processing an output of the first microseismic sensors in order to provide the first microseismic sensors with a directional response comprising a reduced sensitivity to noise coming from a direction of the inner production tubing, such that an ability of the first microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced (Columns 3 and 4; Column 6, Lines 55-61). Deflandre discloses that the seismic receivers can be parameterized so that they record only significant signals containing information about the site. These signals that are processed with the directional

response to have sensitivity to signals that are significant are disclosed E type signals. Deflandre discloses that C type signals are signals from the production tubing.

With regard to claim 9, Deflandre discloses including one or more second microseismic sensors 28, 29 (Fig. 5) positioned between the inner production tubing and the first microseismic sensors located adjacent the outer casing of the well (Column 3, Line 65 to Column 4, Line 51; Column 6, Lines 40-55). Deflandre discloses means for processing an output of the second microseismic sensors in conjunction with an output of the first microseismic sensors such that an ability of the first microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced (Column 6, Line 55 to Column 7, Line 65; Column 3, Line 65 to Column 4, Line 17).

With regard to claim 10, Deflandre discloses including increased sound insulation between the microseismic sensors and inner production tubing such that an ability of the microseismic sensors to detect microseismic signals over a background noise generated by fluid flow inside the inner production tubing is enhanced (Figs, 2-4) (Column 5, Lines 42-47; Column 6, Lines 3-40). Deflandre discloses sound insulation provided between the sensors located adjacent the outer casing and the inner production tubing by acoustically decoupling the sensors from the production tubing 3 and clamping them to the casing.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deflandre in view of Scanlon.

With regard to claim 2, Deflandre does disclose providing the microseismic sensors with a cardioid response. Scanlon discloses using sensors with a cardioid response in seismic applications in order to reduce the noise from the surrounding environment when making a seismic measurement (Column 15). It would have been obvious to modify Deflandre to include cardioid response sensors as taught by Scanlon in order to reduce noise from the borehole environment.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Eriksson, who discloses analyzing noise generated by fluid flow inside production tubing of a well.

Therond, who discloses sensors coupled to the casing of a well for microseismic monitoring.

Haheim, who discloses a sonde to be pressed against a well casing having microseismic sensors.

Withers, who discloses a system for locating seismic events with receivers in a well.

Thomas, who discloses a system for reservoir management.

Vidrine, who discloses a well management system using microseismic sensors.

Albright, who discloses geophones coupled to a well casing for seismic monitoring.

Pavey, who discloses cardioid sensors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571) 272-6979. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAH

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